inoculated appeared to be more or less susceptible to the pink root organism, but other liliaceous plants, such as *Funkia*, *Tulipa*, *Calla*, *Iris*, and *Lilium* were immune. Pink root of onions has been observed in California, Iowa, Wisconsin, New York, and the Bermuda Islands. In Texas it seriously threatens the industry of growing onions for the early northern markets, which industry has become an important one. Losses vary from $150 to $400 per acre.

Symptoms of pink root include yellowing of the roots, followed by their pink discoloration, drying, and death. The bulb exhausts its energy in producing new roots. Alkali soil, deficiency in nitrogen and humus, excessive temperatures, eel worm and thrips attacks are factors favoring the disease. The seed is not a carrier, but onion "sets," both dry and green, may harbor the causal fungus. Suggested control methods include the use of virgin soil for seed bed and field plantings, steam or formaldehyde disinfection of seed beds known to contain the pink root fungus, rotation of crops, the use of quickly acting fertilizers, careful use of tools, and various cultural practices favoring continued growth of the crop. An attempt to control nematodes by adding cyanimide to the soil failed because the amount required to affect nematodes killed the crop.—J. G. Brown.

Carbon nutrition.—Storage rot fungi of the sweet potato have been investigated by Weimer and Harter,[6] who find that seven of eight species causing rot can utilize glucose as a source of carbon. Five of them are able to increase the acidity of the culture medium, and certain species increased the osmotic concentration of the substratum. The glucose is utilized partly as a source of energy, partly in producing mycelium, and perhaps in still other ways. The respiratory activity of these organisms has been studied by the same authors,[7] who used the amount of CO_2 set free as the measure of the carbohydrate used in this process. *Penicillium* sp., *Botrytis cinerea*, and *Sclerotium bataticola* grew slowly, produced relatively large amounts of dry material, consumed nearly all of the glucose, and produced CO_2 most freely. The other species grew more rapidly, but produced comparatively small amounts of CO_2 and did not consume all the glucose. The economic coefficient was found unusually high in two species. *Fusarium acuminatum* required 17.11 G. and *Mucor racemosus* 22.86 G. glucose for each gram of dry matter grown. The CO_2 set free is not equal to the theoretical amount that could have formed from the sugar consumed. Some of the sugar evidently was not completely respired, as alcohol and acids appeared in some of the culture solutions.—C. A. Shull.

Transmission of potato wilts.—Among the various wilts which are responsible for heavy losses sustained by potato growers are those due to attacks of

[6] Weimer, J. L., and Harter, L. L., Glucose as a source of carbon for certain sweet potato storage rot fungi. Jour. Agric. Res. **21**: 189–210. 1921.

[7] ———, Respiration of sweet potato storage rot fungi when grown on a nutrient solution. Jour. Agric. Res. **21**: 211–226. 1921.

Fusarium oxysporium and *Verticillium albo-atrum*. In order to determine the degree of transmission of these wilts through seed tubers, McKAY[8] has carried on experiments with numerous varieties of potatoes for four years. *Verticillium albo-atrum* occurs somewhat more extensively in small tubers than in medium-sized ones, 30–50 per cent of the crop grown from infected seed tubers being diseased with *Verticillium* wilt, as shown by cultures. *Fusarium oxysporium* is transmitted in a lesser degree, and it appears to be capable of remaining virulent in the soil for several years after the production of a crop of potatoes. Vascular discoloration is an unreliable index of *Verticillium* infection, since approximately 7–17 per cent of cultured tubers which produced the fungus show no discoloration, and 55 per cent of the tubers which show brown vascular discoloration give no organism parasitic for the potato. Although the discoloration occurs at the stem end of the tuber, stem-end seed pieces give no more disease than eye-end pieces of the same infected tuber. Numerous species of *Fusarium* and other fungi mostly saprophytic in nature appear in cultures of wilt diseased tubers.—J. G. BROWN.

Colloidal hydration.—In two recent papers MACDOUGAL[9,10] discusses the effects of bases, salts, and other substances on the hydration capacity of prepared colloidal bodies and masses of vegetable cells. In a previous paper[11] he had reported that 0.01 N hydroxides retard the hydration of colloids, and suggested that the chief function of the base forming metals required by plants might be the restricting or limiting of the hydration capacity of the living protoplasm. He now finds that when concentrations of 0.001 to 0.0001 M solutions of chlorides and nitrates, and 0.001 to 0.0001 N hydroxides are used, concentrations comparable to those occurring in living cells, the hydration is increased and not restricted. He therefore reinterprets the function of the metallic elements as accelerators of hydration and growth. Correction is also made regarding the effects of HCl. At a P_H value of 4.2 the acid is now shown to cause more swelling than water. Some interesting studies of the hydration of roots of different ecological types, and of roots grown in different types of soil are reported. In general he concludes that all substances which are known to facilitate growth in plants will at appropriate concentrations increase the hydration capacitv in some of the colloidal objects tested.—C. A. SHULL.

Vertical distribution of Fucus.—*Fucus* has long been regarded as characteristic of the zone of tidal play, largely because of its high light requirement

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8 McKAY, B. M., Transmission of some wilt diseases in seed potatoes. Jour. Agric. Res. **21**:821–847. 1921.

9 MACDOUGAL, D. T., Water deficit and the action of vitamines, amino-compounds, and salts on hydration. Amer. Jour. Bot. **8**:296–302. 1921.

10 ———, The action of bases and salts on biocolloids and cell masses. Proc. Amer. Phil. Soc. **60**:15–30. 1921.

11 ———, Growth in organisms. Science **49**:599–605. 1919.